



Ross River virus and Barmah Forest virus infections: A review of history, ecology, and predictive models, with implications for tropical northern Australia

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Abstract:

The purpose of the present article is to present a review of the Ross River virus (RRV) and Barmah Forest virus (BFV) literature in relation to potential implications for future disease in tropical northern Australia. Ross River virus infection is the most common and most widespread arboviral disease in Australia, with an average of 4,800 national notifications annually. Of recent concern is the sudden rise in BFV infections; the 2005-2006 summer marked the largest BFV epidemic on record in Australia, with 1,895 notifications. Although not life-threatening, infection with either virus can cause arthritis, myalgia, and fatigue for 6 months or longer, resulting in substantial morbidity and economic impact. The geographic distribution of mosquito species and their seasonal activity is determined in large part by temperature and rainfall. Predictive models can be useful tools in providing early warning systems for epidemics of RRV and BFV infection. Various models have been developed to predict RRV outbreaks, but these appear to be mostly only regionally valid, being dependent on local ecological factors. Difficulties have arisen in developing useful models for the tropical northern parts of Australia, and to date no models have been developed for the Northern Territory. Only one model has been developed for predicting BFV infections using climate and tide variables. It is predicted that the exacerbation of current greenhouse conditions will result in longer periods of high mosquito activity in the tropical regions where RRV and BFV are already common. In addition, the endemic locations may expand further within temperate regions, and epidemics may become more frequent in those areas. Further development of predictive models should benefit public health planning by providing early warning systems of RRV and BFV infection outbreaks in different geographical locations. © 2008 Mary Ann Liebert, Inc.

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Resource Description

Early Warning System:

resource focus on systems used to warn populations of high temperatures, extreme weather, or other elements of climate change to prevent harm to health

A focus of content

Exposure :

weather or climate related pathway by which climate change affects health

Climate Change and Human Health Literature Portal

Ecosystem Changes, Meteorological Factors, Precipitation, Temperature

Temperature: Fluctuations

Geographic Feature: ☒

resource focuses on specific type of geography

None or Unspecified

Geographic Location: ☒

resource focuses on specific location

Non-United States

Non-United States: Australasia

Health Impact: ☒

specification of health effect or disease related to climate change exposure

Infectious Disease

Infectious Disease: Vectorborne Disease

Vectorborne Disease: Mosquito-borne Disease

Mosquito-borne Disease: Barmah Forest Virus, Ross River Virus

Mitigation/Adaptation: ☒

mitigation or adaptation strategy is a focus of resource

Adaptation

Model/Methodology: ☒

type of model used or methodology development is a focus of resource

Methodology

Resource Type: ☒

format or standard characteristic of resource

Review

Timescale: ☒

time period studied

Time Scale Unspecified

Vulnerability/Impact Assessment: ☒

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content